

Optimizing Operation of Photovoltaic System Using Neural Network and Fuzzy Logic

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Abstract : It is well known that photovoltaic (PV) cells are an attractive source of energy. Abundant and ubiquitous, this source is one of the important renewable energy sources that have been increasing worldwide year by year. However, in the V-P characteristic curve of GPV, there is a maximum point called the maximum power point (MPP) which depends closely on the variation of atmospheric conditions and the rotation of the earth. In fact, such characteristics outputs are nonlinear and change with variations of temperature and irradiation, so we need a controller named maximum power point tracker MPPT to extract the maximum power at the terminals of photovoltaic generator. In this context, the authors propose here to study the modeling of a photovoltaic system and to find an appropriate method for optimizing the operation of the PV generator using two intelligent controllers respectively to track this point. The first one is based on artificial neural networks and the second on fuzzy logic. After the conception and the integration of each controller in the global process, the performances are examined and compared through a series of simulation. These two controller have prove by their results good tracking of the MPPT compare with the other method which are proposed up to now.

Keywords : maximum power point tracking, neural networks, photovoltaic, P&O

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